

(2) This book covers the ground of Euclid ii., iii. 35 to 37, iv., and vi., together with the properties of harmonic (but not of anharmonic) ranges, the nine-point circle, the radical axis, poles and polars, inverse figures, &c. The text is on the whole more theoretical than practical; the examples are divided into theoretical riders, practical constructions, and calculations, a good and sufficient collection of each being given. The book contains rather more than the average student will require; the authors asterisk some of the less necessary sections, and probably the teacher will advise the omission of others also. The properties of rectangles are developed from the geometrical standpoint; algebraic methods are, however, also given. In the theory of proportion only commensurable quantities are dealt with at first, the extension to incommensurables being given in the last chapter. The book is sound and sensible throughout, and deserves to hold its own easily in the severe competition which text-books on elementary geometry have to face at present.

(3) The author starts by defining integration as the inverse of differentiation, and then shows how to find the indefinite integrals of all the usual standard types. This part of the book may be quite useful, but the latter portion is not so satisfactory. The author has attempted too much for the space at his disposal, and sacrifices in places not only soundness but intelligibility also. Definite integrals are introduced without any adequate explanation, and the connection between definite and indefinite integrals is obscure. It is almost impossible to make applications of the calculus to geometry clear without a single diagram or without proving that a definite integral may be considered as the limit of a sum; this is, however, what the author attempts. In fact, the argument is too condensed to be followed by the type of student for whom the book is written; for instance, such a step as " $-d\theta/dt = a\theta$ ,  $\therefore d\theta/\theta = -adt$ " is sure to give trouble if unexplained.

Minor errors are the statement of the "test-ratio" rule on p. 36, and misprints at the bottom of pp. 42, 43. A book which aims at being "practical" should not calculate the temperature of a cup of tea to four places of decimals.

(4) This book is very short; for the margins and print are large, while twenty-six of its seventy-nine pages are occupied by a somewhat superfluous introduction, and fifteen by solutions of examples. The remainder is devoted to the indefinite integral of  $\cos^m x \sin^n x$  ( $m$  and  $n$  integral) without the aid of reduction formulæ, and to the integral of expressions involving  $\sqrt{a^2 - x^2}$ ,  $\sqrt{a^2 + x^2}$ , &c. This latter part is done better in other books; for surely in integrating  $\sqrt{a^2 + x^2}$  the substitution  $x = a \sinh \theta$  is preferable to  $x = 2a \sin \theta$ .

(5) This book is intended to cover the mathematics learnt in the first year of a two years' course at an engineering school. The authors disregard the traditional division of mathematics into distinct subjects, and introduce the principles of each subject as needed. By thus developing algebra, analysis, and calculus

side by side the student has his interest stimulated, realises the interdependence of different parts of mathematics, and learns the art of choosing the best method of attacking any given problem. Against this must be set the fact that the conventional division of mathematical study has the great advantage of helping the student to systematise his knowledge. If once we admit the principle of no division, we could hardly wish for a better book. The subjects are very skilfully coordinated; the treatment throughout is sound and mathematical without ceasing to be interesting or "practical." The examples are useful and very numerous, and answers are given. In this first year's course is covered a good deal of the more elementary parts of the theory of equations, determinants, graphs, analytical geometry as far as the general equation of the second degree, and differential calculus, including curvature and critical values of functions, but not asymptotes. Conics, especially geometrical conics, are treated less fully than usual; their place is partly taken by other interesting curves. Excellent and interesting though the book is, it makes heavy demands on the reader's attention, and would probably require considerable ability on his part if it is to be mastered in one year.

#### OUR BOOK SHELF.

*Nephilim*. By William J. H. Bohannon. Pp. 236. (New York: Reeve A. Silk, 1908.) Price 1.50 dollars.

"This book is written," so we are told, "to show the error of 'science,' and to point out the truth of statement of the Bible concerning physical phenomena."

It certainly does show the error of "science," as understood or misunderstood by the author of the book. The following extracts are given merely as examples of the style in which the book is written:—

"The more the thermic dominates in structural composition of a body, the more penetrable it is to the magnetic entities of the field of another and the less to the thermic of that field."

"The earth's thermic entities of field, emitted from her equatorial region, her southward geographical pole being toward the sun, were taken outward from him, under the action of the entities of his field, her inseparable thermic entities of field enveloping the separable of her northern regions."

As a further example, we are informed by way of correction that "*Nephilim*," p. 154, fourth sentence, should read: "The planet Jupiter, on the other hand, had three tails, two visible to human eye, passing outward from the poles of the planet and from the sun; the other one magnetic and invisible, but vastly greater than the visible, passing from the equator of the planet toward the sun."

Some of the chapters suggest a kind of vortex theory, while others profess to deal with the theory of the tides. The author of "*Nephilim*" would have stood a better chance of recognition if he had made a careful study of the whole existing literature on one or other of these two subjects. The mere quotation of extracts from articles in popular encyclopædias, the contributors of which were probably limited to 1000 or 2000 words, is a very small step in that direction. Such short articles were never intended to give a complete explanation of all the difficulties which have been studied in connection with these theories;



e.g. the difficulties which the author raises in connection with the energy of wave motion. No good can come of ignoring the vast number of papers that have been published dealing with such difficulties.

There are hundreds of books already written in the same polemic spirit as "Nephilim." The author of each of these books believes himself to be right and everyone else to be wrong, and nearly every possible permutation of the words "force," "energy," "atom," "ether," "gravitation," and such like is represented in the different meanings (if any) the different writers attach to these terms. It would be well if future would-be writers of such books would try their hand at evolving some kind of order out of this tangled mass of mutually contradictory tirades before adding to the collection.

*Le Principe de la Conservation de l'Assise et ses Applications.* By George Matisse. Pp. 65. (Paris: Librairie scientifique, A. Hermann, 1907.) Price 2.50 francs.

THIS small pamphlet describes clearly and simply certain applications of Carnot's principle to physical problems. The unique feature of the book is indicated in the title. The word "assise" groups together certain variables which refer to distinct physical quantities, but which enter into the equations of energy in the same manner. The only equivalent English word we can suggest is the word "fundamental." The solution of many types of problem may then be said to depend on the two principles of the conservation of the fundamental and the conservation of energy. The differential of energy depends in general on a product of the form  $x dy$ , the precise meaning of  $x$  and  $dy$  depending on the kind of problem under contemplation, electrical, thermal, elastic, mechanical, or chemical, as the case may be. In these several cases the "assise," symbolised above by  $dy$ , is respectively electric quantity, entropy, volume, length, and mass. Such quantities all obey the conservation law, which the author concisely defines in these words:—Under the action of physical and chemical phenomena there can be no creation of electricity, of space (linear or cubical), of entropy, or of matter. Four applications are given in which the principle of the Carnot cycle is ingeniously utilised. The novel use of the word "assise" seems to be the main feature of the pamphlet; otherwise there is not much which calls for special remark.

*The Case for the Goat.* With the practical experience of twenty-four experts. By "Home Counties." Pp. x+162. (London: George Routledge and Sons, Ltd., 1908.) Price 3s. 6d.

It is hoped this little book may help to remove ignorant prejudice against the goat, and induce small holders, labourers, and many rural residents to keep this valuable animal. The advantages to be derived from the "poor man's cow" are very imperfectly known in England, and the author sets himself to show what they really are. Goat's milk, he points out, is often as rich again as cow's milk; it may practically be guaranteed to be free from the bacillus of tuberculosis, and is a very valuable food for children, especially for those who cannot digest cow's milk. Moreover, the amount of milk goats yield, and the ease with which food is to be found for them—they will pick up a living in the hedgerows—ensures a very cheap supply of food for rural owners; while they thrive as hand-fed occupants of back yards in the suburbs, and require no more space than a big dog.

The author complains that the Board of Agriculture does not see its way to include the goat in its agri-

cultural census, treating it as a negligible quantity, while a further bitter grievance against the Board is due to its refusal to permit the importation of new blood under guaranteed restrictions, when the goat stock of the kingdom is suffering from in-breeding to a deplorable extent. Less than a score of stock goats are urgently required for this purpose, and the Board's action is not inaptly described as "an oppressive absurdity."

The different breeds of goats suitable for this country, their management, breeding, and the substantial profit to be made out of them is clearly set forth. It is an interesting little book, and the author surely proves his case.

*Confessio Medici.* By the writer of "The Young People." Pp. xi+158. (London: Macmillan and Co., Ltd., 1908.) Price 3s. 6d. net.

"CONFESSIO MEDICI," a title which naturally recalls that of another book by a great physician, need not fear comparison even with Sir Thomas Browne's immortal work, and surely no higher praise can be accorded it. In a series of essays on such subjects as "vocation," "hospital life," "practice," "retirement," "the very end," &c., the author presents to the reader a survey of the responsibilities, the foibles, the hopes, the failures of medical practice. We wish that every student of medicine during his student days would read, mark, learn, and inwardly digest their practical wisdom and happy maxims, and many a practitioner whose finer feelings have perhaps become blunted by too close contact with a stringent life would rise up the better from their perusal.

#### LETTERS TO THE EDITOR.

*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of NATURE. No notice is taken of anonymous communications.]*

#### Who Built the Aberdeen Stone Circles?

IN an article in *NATURE* of April 9 dealing with the orientation of the Aberdeen stone circles, Sir Norman Lockyer says:—"Another of the associated inquiries will be to see if the area of the recumbent stone has also special ethnological or craniological characteristics." It may be of interest, in this connection, to point out that the short cist skeletons in the anatomical museum of Aberdeen University have been derived from an area coinciding very closely with that of the Aberdeen stone circles. These skeletons have been recently measured by Dr. Low (see *Proceedings of the Anatomical and Anthropological Society, University of Aberdeen, 1902-6*), and the measurements, as I showed in a paper read before the British Association at York, reveal the existence, in the early Bronze age, in this district, of a race significantly different from all the prehistoric racial types previously determined in Britain. This race is hyperbrachycephalic, having an average cephalic index of 85, and it is of short stature, 5 feet 3 inches. It differs from the Neolithic race, which was markedly dolichocephalic, and it also differs from the Bronze age race of the round tumuli, whose index was 78 and stature 5 feet 9 inches.

The origin of this prehistoric Aberdeenshire race, with a cephalic index so much higher than that of all known races in neighbouring countries, is at present one of the unsolved problems of British ethnology. Its close association with a special form of stone circles may help to throw some light on the origin of these interesting monuments, as well as on its own.

J. GRAY.

London, S.W., May 11.